

(19)  Europäisches Patentamt  
European Patent Office  
Office européen des brevets



(11) EP 0 997 497 A1

(12) **EUROPEAN PATENT APPLICATION**  
published in accordance with Art. 158(3) EPC

(43) Date of publication:  
03.05.2000 Bulletin 2000/18

(51) Int. Cl.7: C08L 83/04, C08L 67/02,  
C08L 69/00, C08L 71/02,  
C08K 5/10, C08K 5/20,  
C08J 5/18, C08J 9/26,  
B32B 27/00, C01B 33/12,  
H01L 21/3205, H01L 21/316

(21) Application number: 98932538.6

(22) Date of filing: 15.07.1998

(86) International application number:  
PCT/JP98/03186

(87) International publication number:  
WO 99/03926 (28.01.1999 Gazette 1999/04)

(84) Designated Contracting States:  
AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU  
MC NL PT SE  
Designated Extension States:  
AL LT LV RO SI

(30) Priority: 15.07.1997 JP 18976797

(71) Applicant:  
Asahi Kasei Kogyo Kabushiki Kaisha  
Osaka-shi, Osaka 530-8205 (JP)

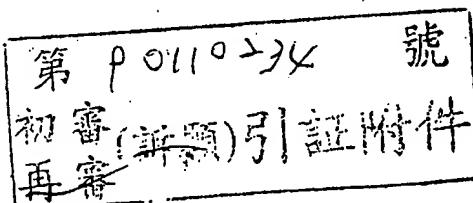
(72) Inventors:  
• IOKA, Takaaki  
Shizuoka-ken 416-0939 (JP)  
• TANABE, Tsuneaki  
Shizuoka-ken 417-0855 (JP)

(74) Representative:  
Strehl Schübel-Hopf & Partner  
Maximilianstrasse 54  
80538 München (DE)

(54) **ALKOXYSILANE/ORGANIC POLYMER COMPOSITION FOR THIN INSULATING FILM PRODUCTION AND USE THEREOF**

(57) Disclosed is an alkoxysilane/organic polymer composition for use in producing an insulating thin film, comprising (A) a specific alkoxysilane; (B) a specific organic polymer; and (C) solvent for alkoxysilane (A) and organic polymer (B), wherein solvent (C) comprises at least one organic solvent selected from the group consisting of amide linkage-containing organic solvents and ester linkage-containing organic solvents. Also disclosed are a silica-organic polymer composite thin film which is produced by a process comprising: forming a thin film of the composition of the present invention; subjecting the thin film to a hydrolysis and dehydration-condensation reaction with respect to the alkoxysilane thereof, to thereby cause the alkoxysilane to be gelled in the thin film; and removing the solvent remaining in the thin film by drying, and a porous silica thin film which is obtained by removing the organic polymer from the silica-organic polymer composite thin film. Both of the silica-organic polymer composite thin film and the porous silica thin film have advantages not only in that these thin films have a low dielectric constant suitable for insulating layers for a multilevel interconnect for a semiconductor device, but also in that these thin films can be produced by a method which can be easily performed in

the current process for producing a semiconductor device.



Search Strategy

(Word)(insulating material) and (Word)(low dielectric constant)

132:116091

**Low dielectric constant** resin composition, production method of **low dielectric constant** insulated film formation method and semiconductor device.

Hasegawa, Toshiaki (Sony Corp., Japan). Jpn. Kokai Tokkyo Koho JP 2000021872-A2-21 Jan 2000, 19 pp. (Japanese). (Japan). CODEN: JKXXAF. CLASS: ICM: H01L021-312. ICS: C08L027-12; C08L065-00; C08L071-08; C08L079-08; C08L083-04; H01L021-768.

APPLICATION: JP 1998-233108 19 Aug 1998. PRIORITY: JP 1998-119375 28 Apr 1998.

DOCUMENT TYPE: Patent CA Section: 76 (Electric Phenomena) Section cross-reference(s): 35

Formation method, and the said low dielec. const. insulator film of the low dielec. const.

insulator film which uses the low dielec. const. and low dielec. const. **insulating material** and the said **insulating material** which are superior in heat resistance are designated as the insulator film between the layer, minute wiring structure possesses, the semiconductor device whose small reliability of the capacitance which is during wiring is high is offered. After contains the silicone porous membrane material and the **low dielec. const. membrane material**, applying the **low dielec. const. resin compn.** and the **low dielec. const. resin compn.** for the insulator film of the **semiconductor device** to the **substrate surface**, dries at 50-200°, after applying formation method of the low dielec. const. insulator film which is calcined next at 300-500°, and the low dielec. const. resin compn. which contains the silicone porous membrane material and the low dielec. const. membrane material to the substrate surface, dries at 50-200°, by calcining next at 300-500°, with the low dielec. const. insulator film as the insulator film between the layer the formation prodn. method of the semiconductor device which possesses the process which is done.

